SATSA Mukhapatra - Annual Technical Issue **27** : 2023 ISSN 0971-975X **Short Communication**

Technology Development and Evaluation of Garden Pea as Off/EARLY Season/Poira Crop in Cooch Behar District under Terai Agro-Climatic Region of West Bengal

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Introduction :

Garden pea (Pisum sativum L. var. hortense) belongs to the family Leguminosae (Fabaceae) is also called sweet pea is a choice vegetable grown for its fresh shelled green seeds rich in protein (7.2 %), vitamins and minerals. The green seeds are used as vegetable or can be used after processing (canning, freezing and dehydration) (Mohan, 2013).

Off/Early/Paira (Relay) cropping is followed where rice is harvested late with high soil saturation and water is scarcity to save the second crop at a later stage. Due to high soil saturation during rice harvesting, fields take another 15 to 20 days to attain appropriate soil moisture for sowing of second crop in Terai regions of West Bengal. In conventional agriculture, farmers keep fallow the land instead of second crop. According to the study of Hedayetullah *et al.* (2018), poira cropping of grass pea and lentil is followed in some areas of West Bengal under rice fallow situation after harvesting of rice in residual soil moisture but chickpea also possible in low to medium land ecosystem. However, literature using vegetable pulse crop as Off/Early/Paira (Relay) cropping is sparse especially in the North Bengal condition.

Making more income by the farmers with easy, adaptable technological intervention by adding on to their existing farming practice in a sustainable way with less carbon footprint is always an achievement & desirable target for the extension workers & scientists. Farmers from the Northern part of West Bengal do conventionally go for Poira Khesari & Lentil. Many farmers from this region go for cultivation of green pea through conventional cultivation practice, i,e., by land preparation after harvesting of the Kharif crop. Now to bring more income generative option for the farmers of this region "POIRA GREEN PEA" cultivation has been explored and also initiatives taken for demonstration, evaluation & popularization amongst the farmers of this region.

Methods :

This study was conducted in 06 nos. of villages comprising 04 Blocks of Cooch Behar District of West Bengal. The survey in northern districts of West Bengal showed delay sowing of garden pea due to delay harvesting of long duration aman paddy and late shower of rains almost in

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every year in all over the northern districts. Hence, to evaluate the effect of early sowing of garden pea on growth and pod yield, 13nos. of village level field demonstration/ farmers own choice, seeing the initial output as poira crop were conducted at different farmers field of 04 Blocks. All the demonstration plots were similar farming situation of medium land having plot size 10 cottah (16.5 decimal) to 20 cottah (33 decimal) with sandy loam soil. In this system over night soaked seeds or just sprouted Garden Pea seeds of high yielding variety (Var. Goldie) @5-6 kg/bigha was broadcasted in paddy field at 10 to 15 days before harvesting i,e. 15th October to 05th November (10 to 15 days before harvesting of short or medium duration aman/kharif paddy having sufficient soil moisture).

Pre-soaked seeds

Seed sowing

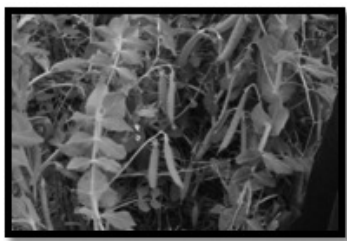
Germinated plant

After harvesting of paddy a fertilizer mixture prepared with 10 q. of well decomposed compost, 08 kg urea, 30 kg SSP and 06 kg MOP were applied per bigha and irrigated. Depending on fertility status, nutrient deficiency of land and considering the crop growth, N:P: K- 19:19:19 fertilizers 5% or DAP 2% and micro nutrient like B, Zn & Molybdenum was sprayed at the time of flower initiation with 10 days intervals. The yield data were collected from 13nos. of demonstration plots. Irrigation was done as and when required.

Result & Discussion :

The mean yield data were calculated by computing the weighted mean. The comparative profitability of D.C crop and farmers practice was also studied by estimating benefit: cost ratio. In all demonstration field higher yield and more extension gap were observed. The gap between demonstration and normal farmers field was due to sowing of poira garden pea in right time and or a little bit early. In case of normal practice farmers are unable to sow in right time due to delay harvesting of long duration *aman* paddy and late showers of rain all most every year. Garden pea sown in right time gets favorable long winter season during crop growth as compared to the late sown normal crop. Accordingly, plant growth of *poira* crop showed more flower, healthier and produced higher yield.

The increase in yield and higher return was mostly due to favorable crop season requisite for garden pea and fetch higher market price as early or off season harvesting as well as marketing. Cost of cultivation and management also played vital role i,e., poira crop required minimum cost and management than normal farmers



Good crop

Happy farmers

Field observation

practice. Garden pea as poira crop allowed at least 2 to 3 plucking more than normal crop during long winter season. On the basis of demand and supply of produce, early or off-season harvest of poira pea, marketing started with 3 to 4 times more price than normal season market price.

During the last 4(four) years of multilocational demonstration/field observation (Table III) in farmers field it is observed that this system may be the best choice to the vegetable growers for not only due to early harvesting & higher yield (>18 q/bigha with an average yield increase of >14% with DC and >9% in farners own initiative compared to normal cultivation) but also with higher return (as in Table II for C: B ratio is 1: 9.2) and restored soil health, incorporating a pulse crop in the cropping system, increasing effective cropping intensity, maintaining crop residue in the field, significantly eliminating stubble burning phenomenon, if any ,easily practicing zero tillage without herbicide or machine. From the table III, it was also observed that the farmers who had owned Poira crop as garden pea, the extension gap in terms of yield also reduced gradually over the years of cultivation. This might be attributed to the beneficial impacts of legume in cropping system alongwith its better management though the experiences of demonstration. Overall the result of different demonstration on cultivation of Garden Pea as Off/early Season Poira Crop in different villages of the CoochBehar District under Terai Agro-Climatic region of West Bengal showed that early sowing of Garden Pea showed promising while incorporating the same in the existing rice-based cropping system.

Conclusion :

Therefore, the observation from these demonstration implied that the cultivation of garden pea through poira system with short and or medium duration rice-based cropping system suited better under Terai Agro-climatic condition of West Bengal.

With the above results & observations for the past three to four years from Coochbehar District has presented a valid case for replication and scale-up with some possible refinement through multi district/ locational observations.

References :

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Table I : Yield performance of different demonstration activities :

Items	No. of D.C	Dt. Of sowing	Yield (q/bigha)	%increase in yield over normal crop	Extension gap (q/bigha)
D.C crop	6	15th October to 5th November	17.95	15.80	2.45
Technology Adapted by the farmer	7	15th October to 5th November	17.65	13.87	2.15
Normal crop	6	15th to 30th Nov,	15.50	—	—

+Extension gap= Demonstration yield – Normal crop yield

Table II : Economics of poira garden pea calculated on the basis of normal local market price :

Items	Cost of cultivation (Rs./bigha)	Gross return (Rs./bigha)	Net return (Rs./bigha)	Cost : Benefit ratio	Market price(Rs./Kg)	
					Starting	Ending
D.C crop	8850	54080	45230	1:6.11	42	15
Technology Adapted in the farmer's field	8700	52162	43462	1:5.99	42	15
Normal crop	9900	31000	21100	1:3.13	20	12

Table III : Multi location, multi year data from field of different activities regarding poira green pea cultivation in Coochbehar District

SEASON & YEAR	Type of activities	Numbers of activities	AREA (bigha))	DATE OF SOWING	YIELD (QUINTAL) PER BIGHA NORMAL	% YIELD INCREASE OVER	EXTENSION GAP (Q/bigha)
RABI-18-19	DC	1	0.5	05.11.2018	17.5	16.64	2.75
	NORMAL	1	0.5	21.11.2018	14.75	-	-
RABI-19-20	DC	2	0.5	28.10.2019	18.05	15.33	2.4
	POIRA-FARMERS OWN INITATIVE	1	0.5	04.11.2019	17.1	9.26	2.35
	POIRA-FARMERS OWN INITATIVE	1	0.5	01.11.2019	17.9	14.37	2.25
	POIRA-FARMERS OWN INITATIVE	1	0.5	27.10.2019	18	15.01	2.35
	NORMAL	1	0.5	18.11.2019	15.65	-	-
RABI-20-21	DC	2	0.5	25.10.2020	17.98	14.52	2.28
	POIRA-FARMERS OWN INITATIVE	2	0.5	04.11.2020	17.6	12.1	1.9
	NORMAL	1	0.5	22.11.2020	15.7	-	-
RABI-2021-22	DC	2	0.5	15.10.2021	18.29	15.03	2.39
	POIRA-FARMERS OWN INITATIVE NORMAL	2	0.5 3	02.11.2021 0.6	17.65 27.11.2021	11 15.9	1.75 - -

Reference D.C farmers :

S.No	Name	Village	Block
1	RajibulAlom	Dewanhat,	CoochBehar-I Block
2	Swapan Kr. Aich	Dewanhat,	CoochBehar-I Block
3	Akhil Das	Holongerkuthi,	CoochBehar-II Block
4	Ahidul Hoque	Shooting Camp,	CoochBehar-II Block
5	SanjitSaha	Dhaldabri,	Tufanganj-II Block
6	Krishnakanta Barman	Burirhat	Dinhata-II Block

Reference adopted farmers :

S.No	Name	Address	Block
1	Ranjit Adhikary	Bhogdabrikesharibari	CoochBehar-I Block
2	Subhas Barman	Ruierkuthi	Dinhata-I Block
3	Akhil Das	Holongerkuthi	CoochBehar-II Block
4	SanjitSaha	Dhaldabri	Tufangani-II Block
5	RajibulAlom	Dewanhat,	CoochBehar-I Block
6	Sarat Roy	Dhangdhinguri	CoochBehar-II Block
7	Mithun Khoria	Atamochor	Tufanganj-II Block
8	Ganesh Khoria	Atamochor	Tufanganj-II Block
9	Gopal Dey	Rampur	Tufanganj-II Block
10	Bhadra Modak	Holongerkuthi	CoochBehar-II Block
11	Harimohan Barman	Holongerkuthi	CoochBehar-II Block
12	Manik Barman	Holongerkuthi	CoochBehar-II Block
13	Anil Das	Holongerkuthi	CoochBehar-II Block
14	Swapan Kr. Aich	Dewanhat,	CoochBehar-I Block
15	Pravat Roy	Dhangdhinguri,	CoochBehar-II Block
16	Ahidul Hoque	Shooting Camp,	CoochBehar-II Block
17	Safar Ali Sarkar	Burirhat	Dinhata-II Block.

Reference traditional farmers :

S.No	Name	Address	Block
1	Kacharuddin Miya	Dewanhat,	CoochBehar-I Block
2	Madan mohanAich	Dewanhat,	CoochBehar-I Block
3	Sukhlal BARMAN	Holongerkuthi	CoochBehar-II Block
4	Manik Pal	Barokoimari	Sitalkuchi Block
5	MatiarRahaman	Holongerkuthi	CoochBehar-II Block
6	Nidhir Adhikary	Bamanhat	Dinhata-II Block